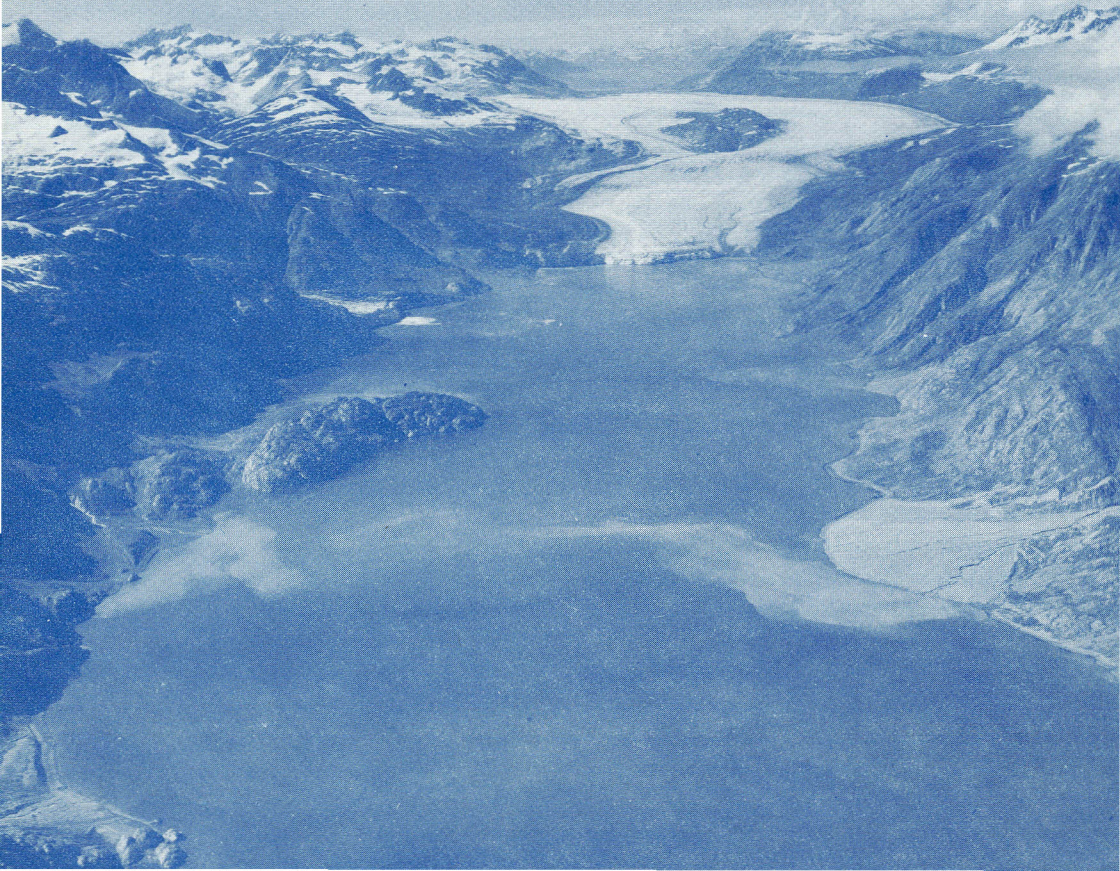
GLACIER BAY

NATIONAL MONUMENT

Alaska



Glacier Bay

NATIONAL MONUMENT

UNITED STATES DEPARTMENT OF THE INTERIOR

Oscar L. Chapman, *Secretary* • NATIONAL PARK SERVICE, Newton B. Drury, *Director*

Glacier Bay is a wilderness of snow-clad peaks and branching tidal inlets. It contains one of the world's most spectacular displays of glaciers, extraordinary scenery, and abundant wildlife

GLACIER BAY NATIONAL MONUMENT, established on February 26, 1925, and embracing 2,297,598 acres of federally owned land, lies on the scenic coast of southeastern Alaska, about 100 miles northwest by boat from the territorial capital of Juneau. The bay itself is about 50 miles long, from 2½ to 10 miles wide, and is fed by glaciers that descend from towering mountains clothed in perpetual snow.

This monument is one of the units of the National Park System owned by the people of the United States. The superlative scenic, historic, and scientific areas comprising this system are administered by the National Park Service of the United States Department of the Interior which is obligated by law to preserve them unimpaired for the benefit of this and future generations.

THE GLACIERS

The monument contains over 20 tremendous glaciers and many others almost equally impressive. They illustrate all stages, from actively moving ice masses to those that are nearly stagnant and slowly dying. The famous Muir Glacier, one of the most active on the Alaska coast, has a sheer face rising some 265 feet above the water, and is nearly 2 miles wide. Most of the eight fiordlike inlets of the bay terminate at one or more similar ice cliffs.

These glaciers are rivers of ice, hundreds, sometimes thousands of feet deep, which flow slowly down the mountain valleys because of the great weight of the snow and ice constantly accumulating at their upper ends, high in the mountains. Along the southeast coast of Alaska, drenched by a continuous succession of westward-moving storms born in the Aleutian region, such glaciers are replenished so constantly that many of them flow all the way to the ocean. There they end in towering cliffs that continually crack off as they become undermined by the water.

When these ice cliffs, some of which are as tall as a 25-story building, crash into the sea, they cause immense waves and sometimes fill the tidal inlets with thousands of drifting bergs and smaller ice fragments. The principal active glaciers are the Muir, Johns Hopkins, Lamplugh, Reid, and Margerie in Glacier Bay and the Lituya and Crillon Glaciers in Lituya Bay.

GLACIER RECESSION AND CLIMATE CHANGES

Even the most rapidly replenished glacial rivers flow extremely slowly compared with water. A daily travel rate of an inch or two is common, a foot or two is comparatively fast, and 20 or 30 feet a day, as in the case of Muir Glacier, is rare and torrential. If the lowland air is sufficiently warm, the glacier melts away at its lower end, or snout, so rapidly that farther advance to the ocean is impossible. Then the vast accumulations of boulders and gravel riding down on its surface from the higher levels, or frozen within it, are deposited at the snout in ridges, called moraines, as the ice melts out of them. The Hugh Miller, Cushing, Adams, and Rendu Glaciers are of this type and no longer reach the sea.

The exact location of the lower end of a glacier represents a fine balance between the opposing forces of replenishment high on the mountain and of melting in the lowlands. If snowfall increases, or the summer season is cool, the snout of the glacier may advance a few feet; if these conditions are reversed, the glacier will shorten and its thickness will decrease. For this reason the advance and retreat of glaciers are sensitive indicators of great importance to studies of long-range climatic changes.

Under observation since 1890, the large periodic fluctuations of glaciers in Glacier Bay National Monument have attracted world-wide attention. Ancient, weathered tree stumps, uncovered by retreating glaciers on the west shore of Whidbey Passage and at other points as far north as Muir and Tidal Inlets, show that the climatic pendulum has swung in a ponderous rhythm of centuries.

With each recession, the barren rock-strewn ground was first reinvaded by fungi, lichens, and mosses. These manufactured soil for the horsetails, fireweed, alpine flowers, dwarf willow thickets, and clumps of cottonwoods and alders that came later. Then, when the soil had been fertilized by many years of plant growth and decay, spruce and hemlock forests gradually clothed the land with a mantle of giant trees.

When the climatic pendulum reversed its swing, the reservoirs of ice among the lofty crests again brimmed full. Floods brought down sand and gravel, which killed the trees and covered over the stumps. Once more the glaciers began to grow and thunderously to make their way down the valleys. In a few decades nothing of the forest remained but the buried stumps, locked in the gravel beneath hundreds of feet

Upper Reid Inlet. *Marg*

ANSEL ADAMS PHOTO.

of solid ice until still another swing of the climatic pendulum centuries later. Then a few trunks were disinterred by swift streams issuing from the retreating glaciers or, where the land had settled at the edge of the bay, by the washing of the salt tides.

About the year 1700, Glacier Bay was completely covered with an icecap some 3,000 feet thick that extended as far south as the Beardslee Islands. Shortly thereafter the ice commenced a slow retreat, apparently brought about by decreasing snowfall and slightly greater lowland temperatures. However, as late as 1892 the ice still covered most of Muir and Reid Inlets, and Tarr Inlet was invisible and unnamed.

In 1899, an earthquake greatly speeded up the downhill ice flows, probably by a titanic joggling action, and upset the established equilibrium. The bay quickly became choked with floating ice masses that put an end to the steamship excursions which for several years had brought thousands of sightseers close to the glacier faces. Recession following this quake was particularly rapid until about 1907 when its effects seem to have largely died out, although floating ice remained more abundant than before the event occurred.

Between 1899 and 1913, Muir Glacier receded 8 miles. By 1921, Tarr Inlet had emerged, but Muir and Reid Inlets still were decidedly shorter than at present. Between 1913 and 1946, Muir Glacier receded an additional 5 miles, leaving John Muir's cabin, originally close to the terminus, more than 13 miles away. If the present trend continues, great changes, of highest scientific interest, will occur in the configuration of the upper bay within the next 50 years, eventually to be reflected in the forests, wildlife, and the entire aspect of the area. Changes equally spectacular and profound will occur if the glaciers again advance, which also appears possible.

FORESTS AND WILDLIFE

The southeast end of the monument, toward the mouth of Glacier Bay, is clothed in moss-draped spruce and hemlock. A visitor by boat or plane, with an opportunity to go ashore, can push through the low, dense alder thickets beyond the beach and step immediately into a luxuriant primeval forest, his feet sinking soundlessly into the deep moss where perhaps no white man has walked before.

Alaska brown bears, grizzlies, black bears, and possibly the rare bluish color phase, called the Glacier Bear, inhabit these forests as do marten, mink, red fox, beaver, wolverine, and Sitka blacktail deer.

Without leaving the boat, one may see mountain goats among the lofty crags on Mount Wright or elsewhere, glimpse porpoises and spouting whales in the broad, sheltered stretches of the bay, or surprise hair seals asleep on the floating ice cakes. Large numbers of waterfowl dot the coves and inlets. They include loons, cormorants, geese, king eiders and many other ducks, various gulls and shore birds, murrelets, guillemots and puffins. Ravens, ptarmigan, and hummingbirds inhabit the shorelands.

ANSEL ADAMS PHOTO.

Ancient stumps prove climatic cycles. They are uncovered by recession of the glaciers after centuries of burial under ice.

Spawning salmon crowd the rushing streams in the spring, attracting many bears, particularly in Bear Track Cove where they have worn broad, winding trails along the stream banks.

THE MOUNTAINS

Glacier Bay lies between two parallel mountain ranges loftier than any in the continental United States. East side peaks belong to the ice-draped St. Elias Range, largely unmapped and unexplored, which reaches a climax 140 miles northwest of the monument in 18,000-foot Mount St. Elias, one of the world's most spectacular glaciated mountains. The St. Elias Range feeds the Muir, Cushing, and associated glaciers. Although its highest peak within the monument, Mount Barnard, reaches an altitude of

erie Glacier ice cliffs from a safe distance of a half mile.

ANSEL ADAMS PHOTO.

Luxuriant forests of spruce and hemlock follow the retreating glaciers.

BRADFORD WASHBURN PHOTO.

BRADFORD WASHBURN AIR PHOTO.

The Fairweather Range where glaciers are born.

North Sandy Cove, one of numerous sheltered anchorages.

ANSEL ADAMS PHOTO.

only 8,214 feet, the sheer rise from sea level accentuates its grandeur.

To the west of the bay lies the snowy Fairweather Range, culminating in 15,320-foot Mount Fairweather on the northwest boundary. Several other peaks, notably Mounts Crillon and Quincy Adams, exceed 12,000 feet. The Johns Hopkins, Brady, Lamplugh, Reid, Hugh Miller, Crillon, LaPerouse, Lituya, and associated glaciers have their origin here. The Grand Pacific Glacier, originating in Canada between the St. Elias and Fairweather Ranges, is a product of both of them.

ISLANDS AND OTHER BAYS

Glacier Bay is studded with islands, some, like the Beardslee archipelago in the south, being low and densely wooded, while others, like the Marble Islands, are steep and largely treeless, and are used as nesting rookeries by thousands of sea birds. The Beardslee Islands and a few others are composed of sand derived from the valleys opposite which they are located. However, the majority are of solid rock, much worn and scarred by the passage of former glaciers.

Opening into Cross Sound, southwest of Glacier Bay, lies beautiful, winding Dundas Bay with heavily wooded shores. From its upper end, nearby Taylor Bay can be reached by a short overland hike. Westward from these the monument extends to the open, gale-lashed North Pacific Ocean. Here, 26 air miles northwest of Icy Point, lies the deep pocket of scenic Lituya Bay, made difficult of access by violent tidal currents that four times each day sweep through its narrow entrance.

GENERAL INFORMATION

At present transportation facilities are limited, and there are no public accommodations in the monument. In 1949, the Canadian Pacific steamer *S. S. Kathleen* inaugurated a schedule of about eight cruises into the bay each summer. Ticket agencies are located in major cities.

Flying time from Juneau to the monument is about 30 minutes, one way, via Alaska Coastal Airlines or chartered plane. A small boat requires about a day to make the same trip, with charter rates varying from $40 to $100 per day, including meals on the boat. At least 3½ days should be allowed for such a boat trip.

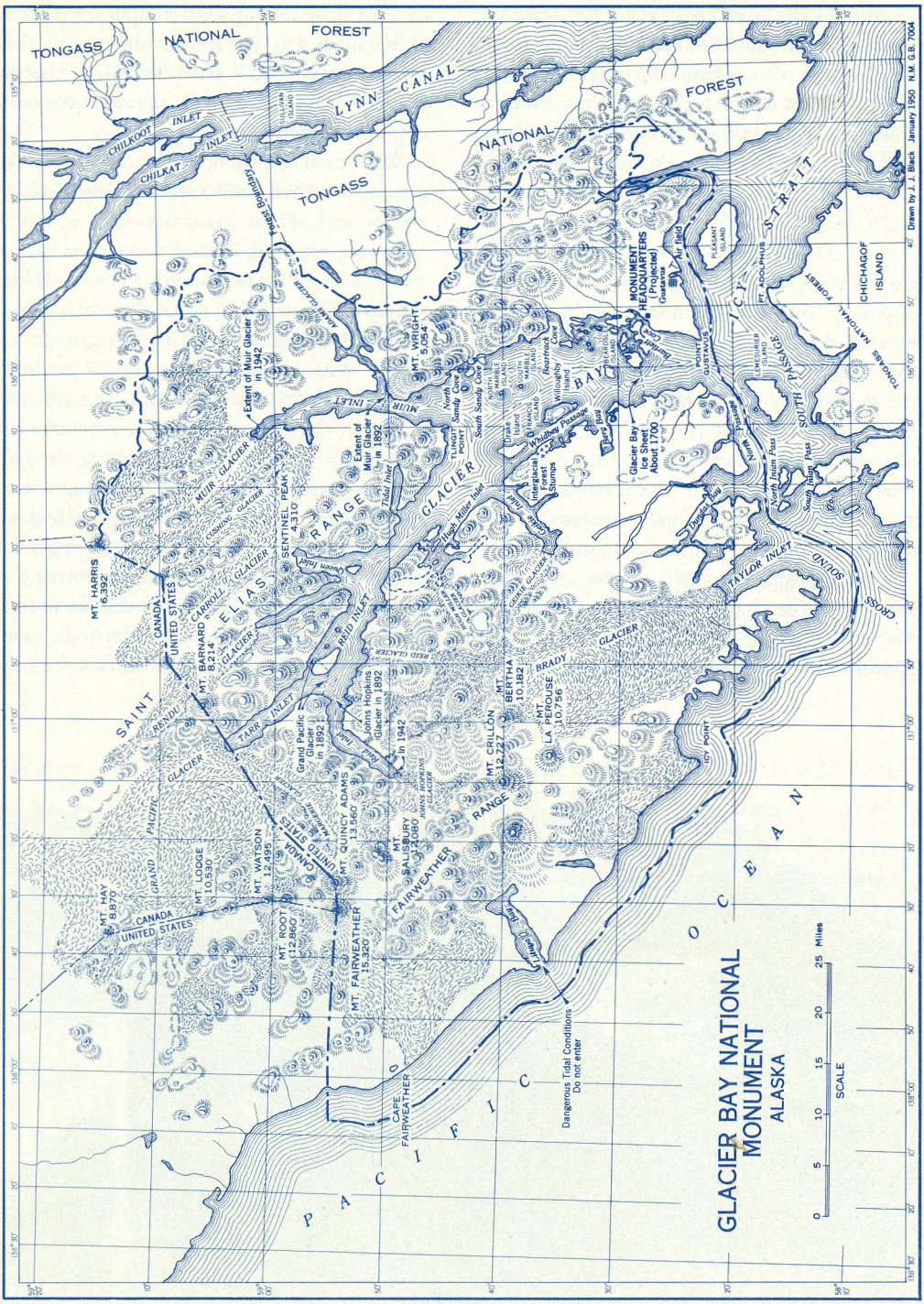
The best anchorages are shown on the map in this folder, but marine navigation should not be undertaken without U. S. Coast and Geodetic Survey Chart 8306, Glacier Bay. Bartlett Cove, North and South Sandy Coves, Hugh Miller Inlet, and Berg Bay are among the best overnight anchoring places.

Floating ice sometimes occurs in enormous quantities at the foot of the glaciers in the upper end of the bay. When falling from the faces of glaciers, it may create waves 30 feet high. Therefore, small boats should not approach closer than half a mile to active glaciers. Icebergs also should not be approached closely because, if disturbed by swells from a small boat in passing, they may roll over.

Shoals and kelp beds are present; daily tides average between 18 and 20 feet; and surveys beyond a line running north from Francis Island to Tlingit Point (western entrance point of Muir Inlet) are incomplete. For these reasons and because of the frequency of Alaska coastal storms, navigation of the bay by small boats is not considered safe without local knowledge. The approach to Dundas Bay should not be attempted by small boats in unfavorable weather because of the frequent occurrence of rough water in Cross Sound. Lituya Bay and the waters of the open coast north of Icy Point should be avoided by small craft at all times.

ADMINISTRATION

Glacier Bay is under the immediate administrative supervision of the Regional Director, Region Four, National Park Service, 180 New Montgomery Street, San Francisco 5, Calif. His field representative is the Superintendent, Sitka National Monument, Sitka, Alaska.



Cover: *Air view of Tarr Inlet and the Grand Pacific Glacier.*

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